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Staphylococcal Infections: Resistance to Antibiotics Is Increasing

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Staphylococcus aureus cause a variety of infections ranging from simple boils and impetigo to severe infections such as toxic shock syndrome and sepsis. The bacteria can be present on the body and cause no problem unless an injury breaks the skin. Infection is often easily treated, but concern is increasing about antibiotic-resistant strains of *S. aureus.*

Antibiotic-resistant Strains

Methicillin-resistant *S. aureus* (MRSA) are resistant to ß-lactam antibiotics, including penicillinase-resistant penicillins (methicillin, oxacillin, nafcillin) and cephalosporins. MRSA is prevalent in hospitalized patients and persons with certain healthcare-associated exposures. Recent reports suggest an increasing frequency of MRSA infections in otherwise healthy persons without typical healthcare-associated risk factors.

Current evidence suggests that these community-acquired strains are genetically distinct from hospital-associated strains, cause a different spectrum of illness, and have different antibiotic susceptibility patterns than do healthcare-associated strains. Community-acquired strains are associated most frequently with skin and soft-tissue infection, and are responsible for the emergence of MRSA as a pathogen in children and young adults. The clinical presentation may include abscess, tissue necrosis, boils, folliculitis, pustular lesions, or lesions resembling insect or spider bites.

Risk Factors

Risk factors for infections with MRSA include:

- History of MRSA infection or colonization in self or close contact
- History in the past year of: hospitalization, admission to a long-term care facility, dialysis for end-stage renal disease, diabetes mellitus, surgery, permanent indwelling devices through the skin, or injection drug use
- Known high prevalence of MRSA in local community or patient population
- Recent or frequent antibiotic use
- Recurrent skin disease
- Crowded living conditions (e.g., homeless shelters) or incarceration
- Sports participation with skin-to-skin contact or equipment sharing
- Certain populations (e.g., Pacific Islanders, Alaskans Natives, Native Americans)
- Some populations of men who have sex with men

Surveillance in Washington

Surveillance for MRSA in Washington State began in 1999 and is based on clinical laboratory isolates. Statewide prevalence of MRSA as a proportion of *S. aureus* isolates reached 33% in 2003 (Figure 1, page 2), with a rate of 47% for isolates from hospitalized patients. Although MRSA occurred at a lower rate in outpatient isolates, surveillance shows striking increases, almost tripling over the past three years from 10% to 28%.

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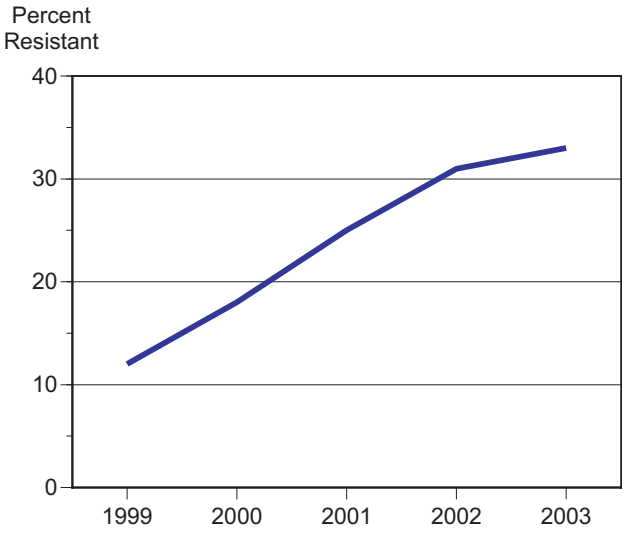
Healthcare systems in Washington are also reporting increases in the proportion of patients with MRSA infection that is community-acquired as distinguished from healthcare-associated. Investigation has identified a predominant MRSA clone that is associated with community-acquired infections and is widely dispersed geographically in Washington. The Department of Health received four reports in 2003 of deaths associated with this predominant community-acquired MRSA strain.

FIGURE 1: Five-year trend for S*taphylococcus aureus* resistant isolates (MRSA) in Washington



(Source: Washington Antibiotic Resistance Sentinel Network)

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Guidelines for Clinicians

The increasing prevalence of MRSA among outpatients and of community-acquired MRSA affects primary care clinicians in several important ways: (1) Clinicians should heighten their level of suspicion for MRSA when staphylococcal infection is suspected; (2) They should be aware of the reduced efficacy of cephalosporins (and all ß-lactam antibiotics) as empiric therapy for suspected skin infection; and (3) They may need to consider routine culture and sensitivity testing to guide treatment choices for suspected staphylococcal infections.

Guidelines for community-acquired MRSA infections were developed jointly by Public Health–Seattle & King County, Tacoma Pierce County Health Department, Department of Health, and the Infectious Disease Society of Washington. "Interim Guidelines for the Evaluation and Management of Community-acquired Methicillin-resistant *Staphylococcus aureus* Skin and Soft-tissue Infections in Outpatient Settings" is available at: http://www.doh.wa.gov/Topics/Antibiotics/providers_MRSA.htm/.

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Highlights from these clinical guidelines for suspected staphylococcal infections of skin and soft-tissue include the following:

- Incise and drain abscesses whenever possible. Antibiotic therapy alone is not recommended for fluctuant abscesses.
- It is important to obtain specimens for culture and susceptibility testing before initiating antibiotic treatment. If incision and drainage cannot be done, consider culture of draining wounds, aspiration or biopsy of central area of inflammation.
- If infection is mild and uncomplicated, local wound care without antibiotics is a reasonable treatment option.
- Local MRSA prevalence and presence of MRSA risk factors should guide empiric treatment choices, which should be adjusted based on information from culture and susceptibility testing. See guidelines for oral antibiotic therapy selection.
- Monitor patients for response to treatment.
- Clinicians should determine whether household or other close contacts have infections and facilitate their evaluation and treatment.
- Patient education is an important component of infection control. Give information on prevention, infection control measures, and wound care to patients and those caring for them.
- Use contact precautions for all patients with open wounds or draining infections and all patients with confirmed MRSA infection. Precautions include the use of gloves and gown when providing care, examination in a private room, and appropriate environmental sanitation.
- Decolonization attempts are not routinely recommended, as the efficacy of methods commonly used to eradicate nasal or skin carriage has not been established in outpatient settings. Situations for which decolonization may be considered, in consultation with an infectious disease specialist, include recurrent MRSA infection despite appropriate therapy and ongoing transmission of the organism in a well-defined cohort with close personal contact.

Prevention Tips

Prevention has a major role in avoiding MRSA infections. Key public education messages include:

- Maintain hand and body hygiene to prevent person-to-person transmission.
- Cleanse and cover sores or wounds to prevent infection and transmission.
- Wash hands before and immediately after touching sores or wounds, on self and others.
- Don’t share personal items such as soap, towels, sports gear, razors, deodorants, and clothing.
- Shower after contact sports or gym exposure.

Schools and athletic programs should ensure that equipment is properly cleaned between users, and encourage coaches to monitor athletes for rashes, boils, scrapes, turf burns, and “insect bites” to facilitate proper treatment and reduce transmission of infection.

Additional Information

For additional information on antibiotic resistance, guidance for clinicians, patient education fact sheets, and links to additional resources see:

http://www.doh.wa.gov/Topics/antibiotics.htm